No. 200200266

THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

University of Idaho

Whereas, THERE HAS BEEN PRESENTED TO THE

Secretary of Agriculture

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED DISTINCT VARIETY OF SEXUALLY REPRODUCED, OR TUBER PROPAGATED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF TWENTY YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR CONDITIONING IT FOR PROPAGATION, OR STOCKING IT FOR ANY OF THE ABOVE PURPOSE , OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT. IN THE UNITED STATES SEED OF THIS VARIETY (1) SHALL BE SOLD BY VARIETY NAME ONLY AS A CERTIFIED SEED AND (2) SHALL CONFORM TO THE NUMBER OF GENERATIONS SPECIFIED BY THE OWNER OF THE STAT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

WHEAT, COMMON

'Moreland'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office *to be affixed at the City of Washington, D.C. this twenty fourth day of June, the year two thousand three.*

Attest:

Commissioner
Plant Variety Protection Office
Agricultural Marketing Service

Secretary of Agriculture

REPRODUCE LOCALLY: Include form number and date on all reproductions

Form Approved - OMB No. 0581-0055

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY - PLANT VARIETY PROTECTION OFFICE

APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE

(Instructions and information collection burden statement on reverse)

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF OWNER
University of Idaho

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NAME
IDO517

3. VARIETY NAME
Moreland

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP Code, and Country)*
College of Agriculture and Life Sciences
University of Idaho
PO Box 442337
Moscow ID 83844-2337

5. TELEPHONE *(include area code)*
(208)397-4181

6. FAX *(include area code)*
(208)397-4311

FOR OFFICIAL USE ONLY

PVPO NUMBER
200200266

FILING DATE
Sept. 18, 2002

7. IF THE OWNER NAMED IS NOT A "PERSON", GIVE FORM OF ORGANIZATION *(corporation, partnership, association, etc.)*
Land-Grant University

8. IF INCORPORATED, GIVE STATE OF INCORPORATION

9. DATE OF INCORPORATION

10. NAME AND ADDRESS OF OWNER REPRESENTATIVE(S) TO SERVE IN THIS APPLICATION. *(First person listed will receive all papers)*

Edward Souza
University of Idaho
PO Box 830
1693 S. 2700 W.
Aberdeen ID 83210

Holly L. Waters
Idaho Agricultural Experiment Station
College of Agricultural and Life Sciences
University of Idaho
P.O. Box 442337
Moscow ID 83844-2337

MH 5-9-2003

FEES RECEIVED

FILING AND EXAMINATION FEES:
$ 2705.00
DATE 9/18/2002

CERTIFICATION FEE:
$ 432.00
DATE 5/8/2003

11. TELEPHONE *(Include area code)*
(208)397-4181

12. FAX *(Include area code)*
(208)397-4311

13. E-MAIL
esouza@uidaho.edu

14. CROP KIND *(Common Name)*
Wheat

18. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow instructions on reverse)

- a. [X] Exhibit A. Origin and Breeding History of the Variety
- b. [X] Exhibit B. Statement of Distinctness
- c. [X] Exhibit C. Objective Description of Variety
- d. [X] Exhibit D. Additional Description of the Variety *(Optional)*
- e. [X] Exhibit E. Statement of the Basis of the Owner's Ownership
- f. [X] Voucher Sample *(2,500 viable untreated seeds or, for tuber propagated varieties, verification that tissue culture will be deposited and maintained in an approved public repository)*
- g. [X] Filing and Examination Fee ($2,705), made payable to "Treasurer of the United States" *(Mail to the Plant Variety Protection Office)*

19. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE SOLD AS A CLASS OF CERTIFIED SEED? *See Section 83(a) of the Plant Variety Protection Act)*
[X] YES *(If "yes", answer items 20 and 21 below)* [ ] NO *(If "no," go to item 22)*

20. DOES THE OWNER SPECIFY THAT SEED OF THIS VARIETY BE LIMITED AS TO NUMBER OF CLASSES? [X] YES [ ] NO
IF YES, WHICH CLASSES? [X] FOUNDATION [X] REGISTERED [X] CERTIFIED

21. DOES THE OWNER SPECIFY THAT THE CLASSES BE LIMITED AS TO NUMBER OF GENERATIONS? [ ] YES [X] NO
IF YES, SPECIFY THE NUMBER 1, 2, 3, *etc.* [ ] FOUNDATION [ ] REGISTERED [ ] CERTIFIED

(If additional explanation is necessary, please use the space indicated on the reverse.)

22. HAS THE VARIETY (INCLUDING ANY HARVESTED MATERIAL) OR A HYBRID PRODUCED FROM THIS VARIETY BEEN SOLD, DISPOSED OF, TRANSFERRED, OR USED IN THE U. S. OR OTHER COUNTRIES?
[ ] YES [X] NO
IF YES, YOU MUST PROVIDE THE DATE OF FIRST SALE, DISPOSITION, TRANSFER, OR USE FOR EACH COUNTRY AND THE CIRCUMSTANCES. *(Please use space indicated on reverse.)*

23. IS THE VARIETY OR ANY COMPONENT OF THE VARIETY PROTECTED BY INTELLECTUAL PROPERTY RIGHT *(PLANT BREEDER'S RIGHT OR PATENT)*?
[ ] YES [X] NO
IF YES, GIVE COUNTRY, DATE OF FILING OR ISSUANCE AND ASSIGNED REFERENCE NUMBER. *(Please use space indicated on reverse.)*

24. The owners declare that a viable sample of basic seed of the variety will be furnished with application and will be replenished upon request in accordance with such regulations as may be applicable, or for a tuber propagated variety a tissue culture will be deposited in a public repository and maintained for the duration of the certificate.

The undersigned owner(s) is(are) the owner of this sexually reproduced or tuber propagated plant variety, and believe(s) that the variety is new, distinct, uniform, and stable as required in Section 42, and is entitled to protection under the provisions of Section 42 of the Plant Variety Protection Act.

Owner(s) is(are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF OWNER	SIGNATURE OF OWNER
Richard C Heimsch	
NAME *(Please print or type)*	NAME *(Please print or type)*
Richard C. Heimsch	
CAPACITY OR TITLE	DATE
Director, Associate Dean	8/26/02
CAPACITY OR TITLE	DATE

Plant Variety Protection Application: Moreland

Exhibit A, Origin and Breeding History of the Variety

Moreland was derived from a cross made at the University of Idaho, Aberdeen Research and Extension Center in 1986, designated A86327W with the pedigree 'Sonora 65'/II-60-155//'Heglar' (CItr 17269) /3/'Warrior' (CItr 13190)//'Kiowa'/PI 178383 /6/'Frocor'//'Frontana'/ 'Yaqui'/3/ 'Wanser' (CItr 13844) /4/ 'McCall' (CItr 13842) /5/Heglar /7/'WAID' (CItr 17806) /2*'Borah' (CItr 17267) //'Neeley' (CItr 17860). Frocor and II-60-155 are hard red spring wheat genotypes originating from Brazil and Minnesota, respectively. A86327W was advanced by the bulk method without intentional selection in the F_2 generation. In the F_3 generation, heads were selected from short plants and planted as $F_{3:4}$ headrows in 1989. Heads from short plants were selected and advance by pedigree selection in 1990 and 1991 to form $F_{6:7}$ headrows, which were harvested in 1992. From these headrows, the selection A86327W-3-2-2 was advanced to testing yield trials in southeastern Idaho in 1993. In 1996, A86327W-3-2-2 was designated IDO517 and entered into the Tri-State Irrigated Winter Wheat Nursery for two years. IDO517 was advanced into the Western Regional Winter Wheat Nursery for two years of testing (2000 and 2001). In 2001, IDO517 was evaluated in the Pacific Northwest Wheat Quality Council. IDO517 was also evaluated in the on-farm extension trials from 1999 to 2001 in Idaho and in 2001 in Oregon and Washington. In 2000, 200 head selections were planted at Aberdeen, ID and selected in summer 2001 for uniform plant type to form Moreland breeder seed. Seed from headrows that were true-to-type were harvested and planted at Aberdeen in 2001 to form foundation seed. IDO517 is uniform for plant type without obvious phenotypic variants and has remained uniform and stable for 11 generations during testing and seed increase, from 1992 to 2002.

Plant Variety Protection Application: Moreland

Exhibit B, Novelty Statement

Moreland is most similar to the hard red winter wheat cultivar 'DW' developed by the University of Idaho. The two cultivars share a common parent, WAID/2*Borah// Neeley. Moreland can be distinguished from DW on the basis of their reaction to dwarf bunt (causal organism *Tilletia controversa* Kühn in Rabenh). A summary of evaluations at Logan, UT are listed in Table 1.

Table 1. Reaction of hard red winter wheats to *Tilletia controversa* Kühn in Rabenh at Logan, UT as measured by percent of infected heads, averaged across two replications.

Year and trial	**Moreland**	**DW**	Average of adjacent susceptible check, **Cheyenne**
	%	%	%
1997 Breeder trials	50	0	75
2000 Western regional nursery	10	0	17
2001 Western regional nursery	85	0	73
Average	**47**	**0**	**55**

U.S. DEPARTMENT OF AGRICULTURE
AGRICULTURAL MARKETING SERVICE
SCIENCE AND TECHNOLOGY
PLANT VARIETY PROTECTION OFFICE
BELTSVILLE, MD 20705

EXHIBIT C
(Wheat)

OBJECTIVE DESCRIPTION OF VARIETY
WHEAT (*Triticum* spp.)

NAME OF APPLICANT(S)
University of Idaho

ADDRESS *(Street and No. or RD No., City, State, and Zip Code)*
CALS
University of Idaho
Moscow ID 83844-2335

FOR OFFICIAL USE ONLY

PVPO NUMBER
20020066

VARIETY NAME

TEMPORARY OR EXPERIMENTAL DESIGNATION

PLEASE READ ALL INSTRUCTIONS CAREFULLY: Place the appropriate number that describes the varietal character of this variety in the boxes below. Place a zero in the first box (e.g. [0][9] or [0][9]) when number is either 99 or less or 9 or less respectively. Data for quantitative plant characters should be based on a minimum of 100 plants. Comparative data should be determined from varieties entered in the same trial. Royal Horticultural Society or any recognized color standard may be used to determine plant colors; designate system used:
Please answer all questions for your variety; lack of response may delay progress of your application.

1. KIND:

[1] 1=Common 2=Durum 3=Club 4=Other (SPECIFY) : _____

2. VERNALIZATION:

[2] 1=Spring 2=Winter 3=Other (SPECIFY) : _____

3. COLEOPTILE ANTHOCYANIN:

[1] 1=Absent 2=Present

4. JUVENILE PLANT GROWTH:

[2] 1=Prostrate 2=Semi-erect 3=Erect

5. PLANT COLOR (boot stage):

[2] 1 = Yellow-Green 2 = Green 3 = Blue-Green

6. FLAG LEAF (boot stage):

[2] 1 = Erect 2 = Recurved [2] 1 = Not Twisted 2 = Twisted
mail 3/10/2003 per Cathy d 1-27-2003

7. EAR EMERGENCE:

[0][4] Number of Days Earlier Than Boundary *

[ ][ ] Number of Days Later Than No relevant earlier check *

200200266

8. ANTHER COLOR:

[1] 1 = Yellow 2 = Purple

9. PLANT HEIGHT (from soil to top of head, excluding awns):

[1][8] cm Taller Than Garland *

[1][0] cm Shorter Than Boundary *

* Relative to a PVPO-Approved Commercial Variety Grown in the Same Trial

10. STEM:

A. ANTHOCYANIN

[1] 1= Absent 2=Present

B. WAXY BLOOM

[1] 1=Absent 2=Present

C. HAIRINESS (last internode of rachis)

[1] 1=Absent 2=Present

D. INTERNODE (SPECIFY NUMBER)

[1] 1= Hollow 2=Semi-solid 3=Solid

E. PEDUNCLE

[1] 1=Absent 2=Present

[9] cm Length

11. HEAD (at Maturity):

A. DENSITY

[2] 1=Lax 2=Middense 3= Dense

B. SHAPE

[2] 1 = Tapering 2= Strap 3 = Clavate 4 = Other (SPECIFY): _____

C. CURVATURE

[1] 1 = Erect 2 = Inclined 3 = Recurved

D. AWNEDNESS

[4] 1 = Awnless 2 = Apically Awnletted 3 = Awnletted 4 = Awned

12. GLUMES (at Maturity):

A. COLOR

[2] 1 = White 2 = Tan

3 = Other (SPECIFY) : _____

B. SHOULDER

[3] 1 = Wanting 2 = Oblique 3 = Rounded 4 = Square 5 = Elevated 6 = Apiculate

C. BEAK

[3] 1 = Obtuse 2 = Acute 3 =Acuminate

D. LENGTH

[2] 1 = Short (ca. 7mm) 2 = Medium (ca. 8mm) 3 = Long (ca. 9mm)

12. GLUMES (at Maturity) *Continued*:

200200266

E. WIDTH

[1] 1 = Narrow (ca. 3mm) 2 = Medium (ca. 3.5mm) 3 = Wide (ca. 4mm)

13. SEED:

A. SHAPE

[1] 1 = Ovate 2 = Oval 3 = Elliptical

B. CHEEK

[1] 1=Rounded 2=Angular

C. BRUSH

[1] 1=Short 2=Medium 3=Long

[1] 1 = Not Collared 2 = Collared

D. CREASE

[1] 1 = Width 60% or less of Kernel
2 = Width 80% or less of Kernel
3 = Width Nearly as Wide as Kernel

[1] 1 = Depth 20% or less of Kernel
2 = Depth 35% or less of Kernel
3 = Depth 50% or less of Kernel

E. Color

[3] 1=White 2= Amber 3= Red
4= OTHER (Specify)

G. PHENOL REACTION *(see instructions)*:

[5] 1 = Ivory 2 = Fawn
3 = Light Brown 4 = Dark Brown
5 = Black

F. TEXTURE

[1] 1=Hard 2=Soft

14. DISEASE: (0=Not Tested; 1=Susceptible; 2=Resistant; 3=Intermediate; 4=Tolerant)

PLEASE INDICATE THE SPECIFIC RACE OR STRAIN TESTED

[0]	Stem Rust *(Puccinia graminis* f. sp. *tritici)*	[3]	Leaf Rust *(Puccinia recondita* f. sp. *tritici)*
[3]	Stripe Rust *(Puccinia striiformis)*	[2]	Loose Smut *(Ustilago tritici)*
[0]	Tan Spot *(Pyrenophora tritici-repentis)*	[0]	Flag Smut *(Urocystis agropyri)*
[0]	Halo Spot *(Selenophoma donacis)*	[1]	Common Bunt *(Tilletia tritici* or *T. laevis)*
[3]	*Septoria nodorum* (Glume Blotch)	[1]	Dwarf Bunt *(Tilletia controversa)*
[0]	*Septoria avenae* (Speckled Leaf Disease)	[1]	Karnal Bunt *(Tilletia indica)*
[3]	*Septoria tritici* (Speckled Leaf Blotch)	[3]	Powdery Mildew *(Erysiphe graminis* f. sp. *tritici)*
[1]	Scab (*Fusarium* spp.)	[0]	"Snow Molds"

14. Disease *(Continued)* (0=Not Tested; 1=Susceptible; 2=Resistant; 3=Intermediate; 4=Tolerant) 20020 00266

PLEASE INDICATE THE SPECIFIC RACE OR STRAIN TESTED

[2]	"Black Point" (Kernel Smudge)	[0]	Common Root Rot *(Fusarium, Cochliobolus* and *Bipolaris* spp.*)*
[1]	Barley Yellow Dwarf Virus (BYDV)	[0]	Rhizoctonia Root Rot *(Rhizoctonia solani)*
[0]	Soilborne Mosaic Virus (SBMV)	[4]	Black Chaff *(Xanthomonas campestris* pv. *translucens)*
[0]	Wheat Yellow (Spindle Streak) Mosaic Virus	[0]	Bacterial Leaf Blight *(Pseudomonas syringae* pv. *syringae)*
[1]	Wheat Streak Mosaic Virus (WSMV)	[ ]	Other (SPECIFY)
[ ]	Other (SPECIFY)	[ ]	Other (SPECIFY)
[ ]	Other (SPECIFY)	[ ]	Other (SPECIFY)
[ ]	Other (SPECIFY)	[ ]	Other (SPECIFY)

15. INSECT: (0=Not Tested; 1=Susceptible; 2=Resistant; 3=Intermediate; 4=Tolerant)

PLEASE SPECIFY BIOTYPE (where needed)

[1]	Hessian Fly *(Mayetiola destructor)*	[ ]	Other (SPECIFY)
[1]	Stem Sawfly *(Cephus* spp.)	[ ]	Other (SPECIFY)
[1]	Cereal Leaf Beetle *(Oulema melanopa)*	[ ]	Other (SPECIFY)
[1]	Russian Aphid *(Diuraphis noxia*	[ ]	Other (SPECIFY)
[0]	Greenbug *(Schizaphis graminum)*	[ ]	Other (SPECIFY)
[0]	Aphids	[ ]	Other (SPECIFY)

16. ADDITIONAL INFORMATION ON ANY ITEM ABOVE, OR GENERAL COMMENTS

Plant Variety Protection Application: Moreland

Exhibit D, Additional Description of Variety

Moreland has an unpigmented coleoptile and semi-erect juvenile growth. Moreland has recurved, twisted flag leaf and an awned, erect, lax head, which is bronze-chaffed at maturity. Moreland is 85 cm tall, similar to 'Brundage' soft white winter wheat, yet 10 cm shorter than 'Boundary' hard red winter wheat and 18 cm taller than 'Garland. Moreland is similar in heading date to 'Brundage', heading, on average in southern Idaho, 156 d after January 1. Moreland heads 4 d earlier than Boundary and 5 d earlier than Garland. Seed of Moreland is hard, red, ovate, and plump, with a kernel type similar to Neeley. Based on field evaluations in Washington and Idaho, Moreland has moderate adult plant resistance to stripe rust [caused by *Puccinia striiformis* (Westend.)]. Under severe stripe rust pressure at Pullman, WA, spring 2002, Moreland had a type 5 reaction occluding 30% of the flag leaf during grain fill. By comparison the resistant cultivar, Boundary had a type 5 reaction occluding 10% of the flag leaf, and the moderately susceptible cultivar Brundage had a type 8 reaction occluding 90% of the flag leaf. In five years of irrigated yield trials in southern Idaho, Moreland was more winter hardy than Boundary, Garland, and Stephens, with average spring stands of 99%, 96%, 96%, and 96%, respectively ($LSD_{95\%}$=1%). Yet, Moreland has poorer snow mold (causal organisms *Typhula* spp.) tolerance than and greater susceptibility to dwarf bunt (*Tilletia controversa* Kühn in Rabenh) than Boundary.

Plant Variety Protection Application: Moreland

Exhibit D, Additional Description of Variety (*Continued*).

Quantitative Data

Table 2a. Agronomic Characteristics of Moreland hard red winter wheat in irrigated trials, 1997 to 2001.

Table 2b. Agronomic Characteristics of Moreland hard red winter wheat in irrigated trials, 1994 to 2001.

Table 2c. Results of Oregon-Idaho regional irrigated nursery, 2000 and 2001.

Table 3. Agronomic performance of hard winter wheats in rain-fed trials, 2000 and 2001, six site-years.

Table 4. Milling and baking data in irrigated research trials, southern Idaho, 1997 to 1999, total of 10 bakes, data by K. O'Brien.

Table 5a to c. Stripe rust and infection type in winter cereals, 2000 and 2001, data of X. Chen, USDA-ARS.

Table 6. Grain yield in 2001 extension trials in Oregon, data by R. Karow, OSU.

Table 7. Washington State University hard winter wheat trials, extension testing program, 2001, data by J. Burns, WSU.

Table 8. Paired comparisons of Moreland with hard red winter wheats in southern Idaho irrigated trials (Dist II, III, IV), 1999 to 2001, data by B. Brown and L. Robertson, UI.

Table 9. Milling and baking data from rain-fed and irrigated extension trials in southern Idaho, 1999 to 2000, data by B. Brown, L. Robertson, and K. O'Brien.

Table 10. Summary of the milling and baking performance of Moreland in the Western Regional Hard Nursery, 2000.

Table 2a. Agronomic Characteristics of Moreland hard red winter wheat in irrigated trials, 1997 to 2001

	Class	Aberdeen grain yield (bu/ac)	Hazelton grain yield (bu/ac)	Test weight (lb/bu)	Spring stand (%)	Heading date (Julian)	Plant height (in)	Lodging (1=upright flat=9)
Moreland	HRW	145	129	60.1	99	156	34	1.0
Boundary	HRW	152	138	60.4	97	160	37	1.3
Garland	HRW	147	123	58.8	96	161	27	1.0
Brundage	SWW	157	135	60.4	96	157	33	1.0
Daws	SWW	155	123	58.9	98	163	36	1.2
Stephens	SWW	149	127	58.4	96	161	37	2.0
Std. Error		5.3	5.1	0.5	1	0.5	2	0.1

Table 2b. Agronomic Characteristics of Moreland hard red winter wheat in irrigated trials, 1994 to 2001

	Class	Aberdeen grain yield (bu/ac)	Hazelton grain yield (bu/ac)	Test weight (lb/bu)	Spring stand (%)	Heading date (Julian)	Plant height (in)	Lodging (1=upright flat=9)
Moreland	HRW	144	128	60.1	98	157	35	1.0
Garland	HRW	140	125	59.0	96	161	28	1.0
Stephens	SWW	142	129	58.2	97	162	38	1.8
Daws	SWW	147	124	59.0	97	163	37	1.4
Std error		3	3	0.3	5	0.5	1	0.2

Table 2c. Results of Oregon-Idaho regional irrigated nursery, 2000 and 2001

	Hermiston, Parma, Hazelton, and Aberdeen				
Cultivar	Grain yield bu/ac	Test weight #/bu	Spring stand %	Heading date julian	Height in
Moreland	137	61	97	148	32
Brundage	144	61	98	150	31
Stephens	135	59	98	154	35
Std. Error	ns	ns	ns	1	2

Table 3. Agronomic performance of hard winter wheats in rain-fed trials, 2000 and 2001, six site-years.

Cultivar	Grain yield bu/ac	Test weight #/bu	Spring stand %	Plant height in
Moreland	48	60.1	93	26
Bonneville	49	62.5	98	32
Boundary	52	59.7	96	27
Declo	48	60.7	94	25
Golden Spike	55	61.5	98	31
Promontory	48	63.2	97	29
Utah 100	53	60.4	96	32
Weston	51	63.2	95	34
Std error	3	1.5	3	2

Table 4. Milling and baking data in irrigated research trials, southern Idaho, 1997 to 1999, total of 10 bakes.

			Mixograph							
	Flour protein %	Milling yield %	Time to peak min	Height of peak cm	Mixing toler. Degrees	Water absorp.	Bake mix time min	Loaf volume ml	Interior texture 1 to 5	Exterior texture 1 to 5
Moreland	11.3	67.2	3.8	6.4	75.8	57.2	3.8	1009	1.4	1.6
Boundary	10.7	69.2	3.0	6.0	79.4	56.5	3.0	892	1.1	1.4
Garland	11.1	64.2	2.2	6.5	70.9	57.4	2.1	935	1.2	1.2
LSD 95%	0.4	1.0	0.3	0.4	2.4	ns	0.3	43	0.1	ns

ns= differences among cultivars are non-significant

TABLE 5a. STRIPE RUST PERCENT (%) AND INFECTION TYPE (T) ON CULTIVARS AND LINES IN THE WINTER REGIONAL DISEASE, 2001

NURSERY (WRDN, EXP01) AT SPILLMAN FARM (LOC01) AND WHITLOW FARM (LOC04) NEAR PULLMAN, WA AND MT VERNON, WA, (LOC5)

			STRIPE RUST							
			LOC01		LOC04		LOC05			
			2-Jul		4-Jul		22-Apr		21-May	
			STAGE 7		STAGE 6-7		STAGE 3		STAGE 4-5	
ID NUMBEF	CULTIVAR OR CR	PLOT	%	T	%	T	%	T	%	T
PI557014	Bonneville	054	00	0	00	0	05	2	02	2
PI603039	Boundary	163	00	0	02	5	05	8	10	2
PI14502B	Brundage	039	00	0	05	8	20	8	90	8
ID0517	Moreland	Ave	00	8	01	8	10	8	65	8
IDO550	Gary	Ave	00	0	00	0	02	2	03	2
CI017860	Neeley	034	00	0	01	8	10	8	20	8
PI558510	Rod	055	00	0	02	8	10	8	15	2-5
CI017596	Stephens	027	00	0	00	0	10	5	15	2
PI599335	WESTBRED 470	Ave	15	8	12	8	22	8	65	8

TABLE 5b. STRIPE RUST PERCENT (%) AND INFECTION TYPE (T) ON CULTIVARS AND LINES IN THE WINTER REGIONAL DISEASE, 2000.

NURSERY (WRDN, EXP01) AT OBSERVATION HILL (LOC02) AND WHITLOW FARM (LOC04) NEAR PULLMAN, WA AND MT VERNON, WA, (LOC5)

			STRIPE RUST									
			LOC02				LOC04		LOC 23			
			7-Jun STAGE 7		30-Jun STAGE 8		28-Jun STAGE 6		12-Apr STAGE 2-3		18-May STAGE 4	
ID NUMBER	CULTIVAR OR CR	PLOT	%	T	%	T	%	T	%	T	%	T
PI557014	Bonneville	054	00	0	00	0	00	0	05	2	05	2=5
PI14502B	Brundage	039	30	8	50	5=8	10	8	50	8	80	8
ID0517	Moreland	Ave	02	8	20	5=8	00	0	30	8	70	8
IDO550	Gary	Ave	10	5	10	2=5	00	0	02	2	05	2=8
CI017860	Neeley	034	20	5	30	5	02	8	20	8	20	2=8
PI558510	Rod	055	30	8	30	5=8	00	0	30	8	30	2=8
CI017596	Stephens	027	00	0	05	2	00	0	10	8	20	2=8
PI599335	WESTBRED 470	Ave	70	8	90	8	20	8	30	8	90	8

TABLE 5c. STRIPE RUST PERCENT (%) AND INFECTION TYPE (T) ON CULTIVARS AND LINES IN THE WINTER SOUZA DISEASE, 2001

NURSERY (EXP06) AT WHITLOW FARM (LOC04) NEAR PULLMAN, WA AND MT VERNON, WA, (LOC5) WHEN RECORDED AT THE

		STRIPE RUST						
		LOC04		LOC05				
		4-Jul STAGE 6-7		23-Apr STAGE 3		22-May STAGE 4-5		
ID NUMBER	PLOT	%	T	%	T	%	T	PM
Boundary	008	00	0	05	2	10	5	
Brundage	010	05	8	30	8	80	8	
Garland	009	10	8	20	8	70	8	
Moreland	024	01	8	20	8	90	8	
Westbred 470	Ave	15	8	27	8	77	8	

Table 6. Grain yield in 2001 extension trials in Oregon.

Cultivar	Class	Grain yield at individual locations					Average grain
		Corvallis	Hermiston	Madras	Ontario	Pendleton	
Moreland	HRW	163	116	135	125	103	128
Boundary	HRW	167	112	125	120	87	122
Delco	HRW	x	x	x	137	x	x
Bruehl	Club	152	99	110	56	81	100
Coda	Club	139	103	121	106	80	110
Edwin	Club	109	83	102	85	67	89
Rely	Club	148	81	121	109	95	111
Temple	Club	132	128	118	96	93	113
Hiller	Club	156	111	131	105	102	121
Rhode	Club	121	95	116	101	100	107
Connie	Durum	132	85	103	120	65	101
Brundage	SW	167	119	135	128	102	130
Foote	SW	162	101	117	96	98	115
Hubbard	SW	168	103	116	116	107	122
ID-B-96	SW	142	112	137	129	97	123
Madsen	SW	164	108	120	123	85	120
Madsen/Stephe	SW	174	114	128	123	96	127
Stephens	SW	154	128	113	138	100	127
Weatherford	SW	160	114	125	128	92	124
Yamhill	SW	155	113	107	102	83	112
Malcolm	SW	156	122	126	137	x	135
Rod	SW	169	136	121	122	96	129
Alzo	Trit	208	101	145	122	85	132
Bogo	Trit	178	88	132	143	86	125

Table 7. Washington State University hard winter wheat trials, extension testing program, 2001.

VARIETY NAME	Grain Yield	Test Weight	Grain Protein
Moreland	42.2	61.1	13.0
Hard White Common			
Gary	44.6	62.2	11.6
Hard Red Common			
BOUNDARY	44.7	61.0	12.4
BUCHANAN	44.1	61.7	11.9
COLUMBIA - 1	37.3	61.9	13.2
ESTICA	45.4	57.5	12.3
FINLEY	44.7	62.9	12.5
HATTON	41.2	63.4	12.5
RESIDENCE	51.9	60.0	12.0
SEMPER	50.0	59.7	12.1
SYMPHONY	44.5	60.7	13.0
WANSER	36.4	62.7	12.8
WESTON	45.0	63.0	13.2
Soft White Common			
ELTAN	48.2	61.5	11.8
NURSERY MEAN	43.3	61.9	12.4
CV %	14.4	0.9	4.5
LSD @ .10	2.8	0.3	0.3

Table 8. Paired comparisons of Moreland with hard red winter wheats in southern Idaho irrigated trials (Dist II, III, IV), 1999 to 2001.

Cultivar	Trials	Grain yield bu/ac	Test weight #/bu	Heading Julian	Height in	Lodging %	Grain protein %
Moreland	12	126	61.9	152	33	0.6	11.7
Boundary	12	130	61.9	156	36	1.6	9.9
		ns	ns	**	***	ns	***
Moreland	18	128	62.3	152	34	0.3	11.2
Garland	18	121	61.6	155	28	0.3	11.2
		*	***	**	***	ns	ns
Moreland	10	123	61.5	150	34	0	11.2
Pillar	10	115	61.4	151	36	0.6	11.9
		***	ns	ns	*	ns	*
Moreland	15	132	63.1	151	35	0.3	11.2
Meridian	15	132	63.5	156	37	4.12	10.6
			ns	*	***	*	**

Table 10. Summary of the performance of Moreland in the Western Regional Hard Nursery, 2000. Evaluation by the Western Wheat Quality Laboratory, Pullman WA.

VARIETY	CLASS	Test weight #/bu	Udy hardness	Single kernel hardness	Kernel weight mg	Kernel diameter mm	Grain protein %	Flour yield %	Break flour %
KHARKOF	HRW	62	70	59	31.7	2.2	14.4	64.7	38.4
WANSER	HRW	62.8	71	58.2	32.4	2.3	13.7	68.1	40.4
UT203032	HRW	62.7	78	59.3	36.4	2.5	12.8	69.4	41.4
NWCPOPE	HRW	63	68	57.4	36	2.4	13.6	67	40.2
DECLO	HRW	62.4	81	70.3	30.1	2.2	13.7	63.2	32.6
Gary	HWW	62.9	78	62.2	33.6	2.4	12.7	66.3	38.7
Moreland	HRW	61	75	60.8	29.4	2.1	13.7	67.8	41.1
IDO562	HRW	64.8	87	59.2	36.3	2.5	12.9	69.8	42.2
MTW9441	HWW	62.7	75	63.9	27.5	2.1	13.6	67.6	41.9
MT9432	HRW	62.4	74	62.6	28.2	2.1	14.9	67.4	40.7

VARIETY	FASH	Milling score	Flour protein %	RVA units	Mix type	Bake absorp. %	Mix time min	Loaf vol. Ml	Bread crumb
KHARKOF	0.38	80.1	12.7	158	3H	67.7	2.4	975	2
WANSER	0.37	84.2	12	167	4H	67.8	3.3	1035	1
UT203032	0.39	84.5	11.5	132	4H	69.8	3.9	1065	1
NWCPOPE	0.4	81.5	11.9	173	2M	66.5	2.2	845	7
DECLO	0.43	75.9	11.5	155	6H	67.7	6.7	910	5
Gary	0.36	82.8	10.8	164	6H	65.5	5.5	920	4
Moreland	0.41	81.8	11.9	169	6H	66.5	5.6	930	3
IDO562	0.37	86	11.2	157	5M	63.8	3.4	990	4
MTW9441	0.38	83.1	11.6	175	6M	64.7	2.3	955	3
MT9432	0.36	84	12.7	184	5H	68	3.9	955	3

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EXHIBIT E
STATEMENT OF THE BASIS OF OWNERSHIP

The following statements are made in accordance with the Privacy Act of 1974 (5 U.S.C. 552a) and the Paperwork Reduction Act (PRA) of 1995.

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2421). Information is held confidential until certificate is issued (7 U.S.C. 2426).

1. NAME OF APPLICANT(S)

University of Idaho
Idaho Agricultural Experiment Station

2. TEMPORARY DESIGNATION OR EXPERIMENTAL NUMBER

IDO517

3. VARIETY NAME

Moreland

4. ADDRESS *(Street and No., or R.F.D. No., City, State, and ZIP, and Country)*

CALS
University of Idaho
PO Box 442335
Moscow ID 83844-2335

5. TELEPHONE *(include area code)*

(208)397-4181

6. FAX *(include area code)*

(208)397-4311

7. PVPO NUMBER

20020266

8. Does the applicant own all rights to the variety? *Mark an "X" in appropriate block.* **If no, please explain.** [X] YES [ ] NO

9. Is the applicant (individual or company) a U.S. national or U.S. based company? [X] YES [ ] NO
If no, give name of country

10. Is the applicant the original owner? [X] YES [ ] NO ***If no, please answer one of the following:***

a. If original rights to variety were owned by individual(s), is (are) the original owner(s) a U.S. national(s)?

[ ] YES [ ] NO **If no, give name of country**

b. If original rights to variety were owned by a company(ies), is(are) the original owner(s) a U.S. based company?

[ ] YES [ ] NO **If no, give name of country**

11. Additional explanation on ownership *(if needed, use reverse for extra space)*:

Moreland was derived from a single cross of two parents owned by the Idaho Agricultural Experiment Station. Selection of the cultivar was performed under the direction of Professor Edward Souza, an employee of the University of Idaho. Under the terms of faculty contract, the intellectual property created by faculty is the property of the University of Idaho.

PLEASE NOTE:

Plant variety protection can be afforded only to owners (not licensees) who meet one of the following criteria:

1. If the rights to the variety are owned by the original breeder, that person must be a U.S. national, national of a UPOV member country, or national of a country which affords similar protection to nationals of the U.S. for the same genus and species.

2. If the rights to the variety are owned by the company which employed the original breeder(s), the company must be U.S. based, owned by nationals of a UPOV member country, or owned by nationals of a country which affords similar protection to nationals of the U.S. for the same genus and species.

3. If the applicant is an owner who is not the original owner, both the original owner and the applicant must meet one of the above criteria.

The original breeder/owner may be the individual or company who directed final breeding. See Section 41(a)(2) of the Plant Variety Protection Act for definition.